

#19

K. KERR

Re-RUN



1600

## RAW SEQUENCE LISTING

DATE: 02/11/2003

PATENT APPLICATION: US/09/710,262E

TIME: 14:54:54

Input Set : A:\ROSENBG.txt

Output Set: N:\CRF4\02112003\I710262E.raw

ENTERED

3 <110> APPLICANT: Rosenberg, Eugene  
 4 Ron, Eliora  
 5 Orr, Elisha  
 6 Paitan, Yossi  
 8 <120> TITLE OF INVENTION: GENE CLUSTER  
 10 <130> FILE REFERENCE: 2290.00076  
 C--> 12 <140> CURRENT APPLICATION NUMBER: US/09/710,262E  
 13 <141> CURRENT FILING DATE: 1999-01-29  
 15 <160> NUMBER OF SEQ ID NOS: 20  
 17 <170> SOFTWARE: PatentIn Ver. 2.1  
 19 <210> SEQ ID NO: 1  
 20 <211> LENGTH: 2392  
 21 <212> TYPE: PRT  
 22 <213> ORGANISM: Myxococcus xanthus  
 24 <400> SEQUENCE: 1  
 25 Val Asp Pro Ala Arg Leu Thr Arg Ala Trp Glu Gly Leu Leu Glu Arg  
 26 1 5 10 15  
 28 Tyr Pro Leu Leu Ala Gly Ala Ile Arg Val Glu Gly Thr Glu Pro Val  
 29 20 25 30  
 31 Ile Val Pro Ser Gly Gln Val Ser Ala Glu Val His Glu Val Pro Ser  
 32 35 40 45  
 34 Val Ser Asp Ser Ala Leu Val Ala Thr Leu Arg Ala Ser Ala Lys Val  
 35 50 55 60  
 37 Pro Phe Asp Leu Ala Cys Gly Pro Leu Ala Arg Leu His Leu Tyr Ser  
 38 65 70 75 80  
 40 Arg Ser Glu His Glu His Val Leu Leu Leu Cys Phe His His Leu Val  
 41 85 90 95  
 43 Leu Asp Gly Ala Ser Val Ala Pro Leu Leu Asp Ala Leu Arg Glu Arg  
 44 100 105 110  
 46 Tyr Ala Gly Thr Glu Ala Lys Ala Gly Leu Leu Glu Val Pro Ile Val  
 47 115 120 125  
 49 Ala Pro Tyr Arg Ala Ala Val Glu Trp Glu Gln Leu Ala Ile Gly Gly  
 50 130 135 140  
 52 Asp Glu Gly Arg Arg His Leu Asp Tyr Trp Arg His Val Leu Ala Thr  
 53 145 150 155 160  
 55 Pro Val Pro Pro Pro Leu Asn Leu Pro Thr Asp Arg Pro Arg Ser Ala  
 56 165 170 175  
 58 Thr Gly Leu Asp Ser Glu Gly Ala Thr His Ser Gln Arg Val Pro Thr  
 59 180 185 190  
 61 Glu Gln Ala Leu Arg Leu Arg Glu Phe Ala Arg Ala Gln Gln Val Ser  
 62 195 200 205  
 64 Leu Pro Thr Val Leu Leu Gly Leu Tyr Tyr Ala Leu Leu His Arg His  
 65 210 215 220

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```

67 Thr Arg Gln Asp Asp Val Val Val Gly Ile Pro Thr Met Gly Arg Pro
68 225                230                235                240
70 Arg Ala Glu Leu Ala Thr Ala Ile Gly Tyr Phe Val Asn Val Met Ala
71                245                250                255
73 Val Arg Ala Arg Gly Leu Gly Gln His Ser Phe Gly Ser Leu Leu Arg
74                260                265                270
76 His Leu His Asp Ser Val Ile Asp Gly Leu Glu His Ala His Tyr Pro
77                275                280                285
79 Phe Pro Arg Val Val Lys Asp Leu Arg Leu Ser Asn Gly Pro Glu Glu
80                290                295                300
82 Ala Pro Gly Phe Gln Thr Met Phe Thr Phe Gln Ser Leu Gln Leu Thr
83 305                310                315                320
85 Ser Ala Pro Pro Arg Pro Glu Pro Arg Ser Gly Gly Leu Pro Glu Leu
86                325                330                335
88 Glu Pro Leu Asp Cys Val His Gln Glu Gly Ala Tyr Pro Leu Glu Leu
89                340                345                350
91 Glu Val Val Glu Gly Ala Lys Gly Leu Thr Leu His Phe Lys Tyr Asp
92                355                360                365
94 Ala Arg Leu Tyr Glu Ala Asp Thr Val Glu Arg Met Ala Arg Gln Leu
95                370                375                380
97 Leu Arg Ala Ala Asp Gln Val Ala Asp Gly Val Glu Ser Pro Leu Ser
98 385                390                395                400
100 Ala Leu Ser Trp Leu Asp Asp Glu Glu Arg Thr Leu Leu Arg Asp
101                405                410                415
103 Trp Asn Ala Thr Ala Thr Pro Phe Leu Glu Asp Leu Gly Val His Glu
104                420                425                430
106 Leu Phe Gln Arg Gln Ala Arg Glu Thr Pro Asp Ala Met Ala Val Ser
107                435                440                445
109 Tyr Glu Gly His Ser Leu Ser Tyr Gln Ala Leu Asp Thr Arg Ser Arg
110                450                455                460
112 Glu Ile Ala Ala His Leu Lys Ser Phe Gly Val Lys Pro Gly Ala Leu
113 465                470                475                480
115 Val Gly Ile Tyr Leu Asp Arg Ser Ala Glu Leu Val Ala Ala Met Leu
116                485                490                495
118 Gly Val Leu Ser Ala Gly Ala Ala Tyr Val Pro Leu Asp Pro Val His
119                500                505                510
121 Pro Glu Asp Arg Leu Arg Tyr Met Leu Glu Asp Ser Gly Val Val Val
122                515                520                525
124 Val Leu Ala Arg Gln Ala Ser Arg Asp Lys Val Ala Ala Ile Ala Gly
125                530                535                540
127 Ala Ser Cys Lys Val Cys Val Leu Glu Asp Val Lys Ala Gly Ala Thr
128 545                550                555                560
130 Ser Ala Pro Ala Gly Thr Ser Pro Asn Gly Leu Ala Tyr Val Ile Tyr
131                565                570                575
133 Thr Ser Gly Ser Thr Gly Arg Pro Lys Gly Val Met Ile Pro His Arg
134                580                585                590
136 Gly Val Val Asn Phe Leu Leu Cys Met Arg Arg Thr Leu Gly Leu Lys
137                595                600                605
139 Arg Thr Asp Ser Leu Leu Ala Val Thr Thr Tyr Cys Phe Asp Ile Ala

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```

140      610      615      620
142 Ala Leu Glu Leu Leu Leu Pro Leu Cys Ala Gly Ala Gln Val Ile Ile
143 625      630      635      640
145 Ala Ser Ala Glu Thr Val Arg Asp Ala Gln Ala Leu Lys Arg Ala Leu
146      645      650      655
148 Arg Thr His Arg Pro Thr Leu Met Gln Ala Thr Pro Ala Thr Trp Thr
149      660      665      670
151 Leu Leu Phe Gln Ser Gly Trp Glu Asn Ala Glu Arg Val Arg Ile Leu
152      675      680      685
154 Cys Gly Gly Glu Ala Leu Pro Glu Ser Leu Lys Ala His Phe Val Arg
155      690      695      700
157 Thr Ala Ser Asp Val Trp Asn Met Phe Gly Pro Thr Glu Thr Thr Ile
158 705      710      715      720
160 Trp Ser Thr Met Ala Lys Val Ser Ala Ser Arg Pro Val Thr Ile Gly
161      725      730      735
163 Lys Pro Ile Asp Asn Thr Gln Val Tyr Val Leu Asp Asp Arg Met Gln
164      740      745      750
166 Pro Val Pro Ile Gly Val Pro Gly Glu Leu Trp Ile Ala Gly Ala Gly
167      755      760      765
169 Val Ala Cys Gly Tyr Leu Asn Arg Pro Ala Leu Thr Ala Glu Arg Phe
170      770      775      780
172 Val Ser Asn Pro Phe Thr Pro Gly Thr Thr Leu Tyr Arg Thr Gly Asp
173 785      790      795      800
175 Leu Ala Arg Trp Arg Ala Asp Gly Glu Val Glu Tyr Leu Gly Arg Leu
176      805      810      815
178 Asp His Gln Val Lys Val Arg Gly Phe Arg Ile Glu Met Gly Glu Ile
179      820      825      830
181 Glu Ala Gln Leu Ala Gly His Pro Ser Val Lys Asn Cys Ala Val Val
182      835      840      845
184 Ala Lys Glu Leu Asn Gly Thr Ser Gln Leu Val Ala Tyr Cys Gln Pro
185      850      855      860
187 Ala Gly Thr Ser Phe Asp Glu Glu Ala Ile Arg Ala His Leu Arg Lys
188 865      870      875      880
190 Phe Leu Pro Asp Tyr Met Val Pro Ala His Val Phe Ala Val Asp Ala
191      885      890      895
193 Ile Pro Leu Ser Gly Asn Gly Lys Val Asp Arg Gly Gln Leu Met Ala
194      900      905      910
196 Arg Pro Val Val Thr Arg Arg Lys Thr Ser Ala Val His Ala Arg Ser
197      915      920      925
199 Pro Val Glu Ala Thr Leu Val Glu Leu Trp Lys Asn Val Leu Gln Val
200      930      935      940
202 Asn Glu Val Gly Val Glu Asp Arg Phe Phe Glu Val Gly Gly Asp Ser
203 945      950      955      960
205 Val Leu Ala Ala Val Leu Val Glu Glu Met Asn Arg Arg Phe Asp Thr
206      965      970      975
208 Arg Leu Ala Val Thr Asp Leu Phe Lys Tyr Val Asn Ile Arg Asp Met
209      980      985      990
211 Ala Arg His Met Glu Gly Ala Thr Ala Gln Ala Arg Thr Gly Ala Thr
212      995      1000      1005

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```

214 Glu Pro Ala Arg Glu Asp Thr Ala Ser Glu Arg Asp Tyr Glu Gly Ser
215      1010      1015      1020
217 Leu Ala Val Ile Gly Ile Ser Cys Gln Leu Pro Gly Ala Ala Asp Pro
218 1025      1030      1035      1040
220 Trp Arg Phe Trp Lys Asn Leu Arg Glu Gly Arg Asp Ser Val Val Ala
221      1045      1050      1055
223 Tyr Arg His Glu Glu Leu Arg Glu Leu Gly Val Pro Glu Glu Val Leu
224      1060      1065      1070
226 Arg Asp Ser Arg Tyr Val Ala Val Arg Ser Ser Ile Glu Asp Lys Glu
227      1075      1080      1085
229 Cys Phe Asp Pro His Phe Phe Gly Leu Thr Ala Arg Asp Ala Ser Phe
230      1090      1095      1100
232 Met Asp Pro Gln Phe Arg Leu Leu Leu Met His Ala Trp Lys Ala Val
233 1105      1110      1115      1120
235 Glu Asp Ala Ala Thr Thr Pro Glu Arg Leu Gly Pro Cys Gly Val Phe
236      1125      1130      1135
238 Met Thr Ala Ser Asn Ser Phe Tyr His Gln Gly Ser Pro Gln Phe Pro
239      1140      1145      1150
241 Ala Asp Gly Gln Pro Val Leu Arg Thr Ala Glu Glu Tyr Val Leu Trp
242      1155      1160      1165
244 Val Leu Ala Gln Ala Gly Ser Ile Pro Thr Met Val Ser Tyr Lys Leu
245      1170      1175      1180
247 Gly Leu Lys Gly Pro Ser Leu Phe Val His Thr Asn Cys Ser Ser Ser
248 1185      1190      1195      1200
250 Leu Ser Ala Leu Tyr Val Ala Gln Gln Ala Ile Ala Ala Gly Asp Cys
251      1205      1210      1215
253 Gln Thr Ala Leu Val Gly Ala Ala Thr Val Phe Pro Ser Ala Asn Leu
254      1220      1225      1230
256 Gly Tyr Leu His Gln Arg Gly Leu Asn Phe Ser Ser Ala Gly Arg Val
257      1235      1240      1245
259 Lys Ala Phe Asp Ala Ala Ala Asp Gly Met Ile Ala Gly Glu Gly Val
260      1250      1255      1260
262 Ala Val Leu Val Val Lys Asp Ala Ala Ala Val Arg Asp Gly Asp
263 1265      1270      1275      1280
265 Pro Ile Tyr Cys Leu Val Arg Lys Val Gly Ile Asn Asn Asp Gly Gln
266      1285      1290      1295
268 Asp Lys Val Gly Leu Tyr Ala Pro Ser Ala Thr Gly Gln Ala Glu Val
269      1300      1305      1310
271 Ile Arg Arg Leu Phe Asp Arg Thr Gly Ile Asp Pro Ala Ser Ile Gly
272      1315      1320      1325
274 Tyr Val Glu Ala His Gly Thr Gly Thr Leu Leu Gly Asp Pro Val Glu
275      1330      1335      1340
277 Val Ser Ala Leu Ser Glu Ala Phe Arg Thr Phe Thr Asp Arg Arg Gly
278 1345      1350      1355      1360
280 Tyr Cys Arg Leu Gly Ser Val Lys Ser Asn Leu Gly His Leu Asp Thr
281      1365      1370      1375
283 Val Ala Gly Leu Ala Gly Leu Ile Lys Thr Ala Leu Ser Leu Arg Gln
284      1380      1385      1390
286 Gly Glu Val Pro Pro Thr Leu His Val Thr Gln Val Asn Pro Lys Leu

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287          1395          1400          1405
289 Glu Leu Thr Asp Ser Pro Phe Val Ile Ala Asp Arg Leu Ala Pro Trp
290          1410          1415          1420
292 Pro Ser Leu Pro Gly Pro Arg Arg Ala Ala Val Ser Ala Phe Gly Leu
293 1425          1430          1435          1440
295 Gly Gly Thr Asn Thr His Ala Ile Leu Glu His Tyr Pro Arg Asp Ser
296          1445          1450          1455
298 Arg Pro Arg Glu Arg Ser Gln Arg Ser Asn Ala Val Arg Ala Val Ala
299          1460          1465          1470
301 Pro Phe Ser Ala Arg Thr Leu Glu Ala Leu Lys Asp Asn Leu Arg Ala
302          1475          1480          1485
304 Leu Leu Asp Phe Leu Glu Asp Pro Ala Ser Ala Glu Val Ala Leu Ala
305          1490          1495          1500
307 Asp Ile Thr Tyr Thr Leu Gln Val Gly Arg Val Ala Met Pro Glu Arg
308 1505          1510          1515          1520
310 Met Val Val Thr Ala Ser Thr Arg Asp Glu Leu Val Glu Gly Leu Arg
311          1525          1530          1535
313 Arg Gly Ile Ala Thr Val Gly Gly Ala His Val Gly Thr Val Val Asp
314          1540          1545          1550
316 Thr Ser Pro Ser Val Asp Ala Asp Ala Arg Ala Val Ala Glu Ala Trp
317          1555          1560          1565
319 Ala Thr Gly Asp Ser Ile Asp Trp Asp Ser Leu His Gly Asp Val Lys
320          1570          1575          1580
322 Pro Ala Arg Val Ser Leu Pro Thr Tyr Gln Phe Ala Lys Glu Arg Tyr
323 1585          1590          1595          1600
325 Gly Leu Ser Pro Ala His Ser Val Ala Asn Ser Ser Lys Thr His Pro
326          1605          1610          1615
328 Asp Ala Gly Val Pro Leu Phe Val Pro Thr Trp Gln Pro Trp Ser Glu
329          1620          1625          1630
331 Gly Ala Ser Asn Ala Ser Leu Ala Leu Arg His Leu Val Val Leu Cys
332          1635          1640          1645
334 Glu Pro Leu Asp Ala Leu Gly Ala Glu Gly Ala Ser Ala Leu Ala Ser
335          1650          1655          1660
337 Thr Leu Ala Asp Arg Arg Ile Glu Val Val Arg Thr Ser Ser Pro Ser
338 1665          1670          1675          1680
340 Ala Arg Leu Asp Ala Arg Phe Met Ala His Ala Ser Ala Val Phe Glu
341          1685          1690          1695
343 Arg Val Lys Ala Leu Leu Ser Glu Arg Leu Thr Ala Pro Val Thr Leu
344          1700          1705          1710
346 Gln Val Leu Val Pro Glu Glu Arg Asp Ala Leu Ala Leu Ser Gly Leu
347          1715          1720          1725
349 Gly Ser Leu Leu Arg Ser Val Ser Gln Glu Asn Pro Leu Val Arg Gly
350          1730          1735          1740
352 Gln Leu Ile Arg Val Gln Gly Ser Val Ser Ala Ser Ala Leu Val Asp
353 1745          1750          1755          1760
355 Val Leu Val Lys Ser Ala Arg Ala Gly Asp Val Thr Asp Ser Arg Tyr
356          1765          1770          1775
358 His Ala Gly Gln Leu Ser Arg Cys Glu Trp Arg Glu Ala Arg Val Ala
359          1780          1785          1790

```

**VERIFICATION SUMMARY**

DATE: 02/11/2003

PATENT APPLICATION: **US/09/710,262E**

TIME: 14:54:55

Input Set : **A:\ROSENBG.txt**

Output Set: **N:\CRF4\02112003\I710262E.raw**

L:12 M:270 C: Current Application Number differs, Replaced Current Application Number